

OPTICAL PHENOMENA.

Solar halos were observed as follows: 1st, Del., Md.; 2nd, Tex., Cal.; 3rd, Neb.; 4th, Ind., Mass., N. J., Ohio, R. I.; 5th, Cal.; 6th, Fla., Cal.; 7th, Ind., Mich., Ohio; 8th, Me., Mass., R. I., Cal.; 9th, Cal., 10th, Ohio; 11th, Ill., Tex., Cal.; 12th, La.; 13th, Ill., Iowa, Miss., Conn.; 14th, Ind., Me., N. J., Ohio, Conn., Va., Ky., W. Va., Cal.; 15th, Conn., Del., Mass., N. H., N. J., N. C., Tex., R. I., Ga.; 16th, Ill., Ind.; 17th, Me., N. H.; 18th, Ill., Neb.; 19th, Conn., N. Y., Tenn., R. I., S. C.; 20th, Ill., Ind., Ohio, Cal.; 21st, Md., Pa., Va., Col., Cal.; 22nd, Iowa, La., Miss., N. J., Ala., N. H., Cal.; 23rd, Cal.; 24th, Dak., R. I., Conn.; 25th, Kan., S. C., Ga.; 27th, Neb., R. I., Conn., Col.; 28th, Conn., Dak.; 29th, Dak., Ill., Iowa, Kan., Neb.; 30th, Cal.

Lunar Halos.—9th, Minn., Neb.; 10th, Minn.; 11th, Minn., Mo., Cal., Tex., La.; 12th, Conn., Minn., Mo., Neb., Tex., Iowa; 13th, Me., Conn., Mich., Ohio, Minn., W. Va., Tex., Cal., Idaho, La., Ill., N. J., Pa.; 14th, Me., N. H., Mass., R. I., Conn., N. J., Pa., Md., Va., N. Y., Minn., Dak., W. Va., Tex., Cal., La., Ala., Del., N. C., Ohio; 15th, Mass., R. I., Conn., N. J., Pa., Va., N. C., S. C., Ga., Wis., Minn., Cal., Tex., La., Ala., Fla., Del., Iowa, Md., Neb.; 16th, Me., N. H., Mass., Fla., Ohio, Minn., Mo., Cal., Neb., Tex., Cal., Ind., Mich., N. J., Ohio; 17th, Cal., Me., Conn., Pa., N. C., Ky., Mo., Neb., Tex., Ala., Ill., Iowa; 18th, Conn., N. C., Ohio, Dak., Cal., Tex., Idaho, La., Ala., Ill., Iowa, Utah; 19th, Me., Conn., N. C., Va., Ga., Fla., Tenn., Tex., Cal., Ill., Mass., N. J., N. Y., Ohio, Pa., Utah; 20th, N. C., S. C., Mich., Ohio, Tex., Cal., Idaho, Ind., Mass., Utah, Va., Wis.; 21st, Me., N. H., Mass., R. I., Conn., Va., Kan., Neb., N. M., R. T., Idaho, La., Ala., Cal., Del., Ind., Iowa, Md., Mo., N. Y.; 22nd, Me., Mass., R. I., Minn., Dak., Iowa, Mo., Neb., Kan., Cal., Tex., Iowa; 23rd, Me., N. H., Mass., Conn., N. J., Iowa, Neb., Kan., Iowa, Vt.; 24th, Iowa, Dak., Tex., Idaho, Kan., N. J.; 25th, Va., Ill.; 26th, Iowa, N. Y.; 27th, Ga., Neb., Ind., N. J.; 29th, Idaho.

Mirage was observed on the 3d, Conn.; 7th, Conn.; 9th, Ga.; 11th, Conn.; 13th, Conn.; 15th, N. C.; 17th, Mass.; 20th, Conn.; 21st, Conn.; 26th, Ga.

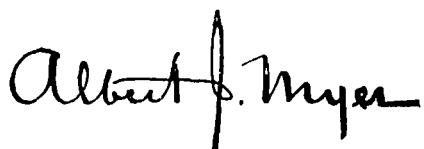
SOLAR PHENOMENA.

Sun spots.—The following observations, made by Mr. D. P. Todd, upon the spots of the sun, have been kindly communicated by Rear Admiral John Rodgers, U. S. N. Superintendent of the Naval Observatory:

Nov., 1877.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
1st, 11 a. m....	0	0	0	0	0	0	2	30	
3rd, 2 p. m....	0	0	0	0	0	0	2	20	
4th, 3 p. m....	0	0	0	0	0	0	2	12	
7th, 3 p. m....	0	0	—	—	0	0	0	0	
11th, 3 p. m....	0	0	0	0	0	0	0	0	
12th, 11 a. m....	0	0	0	0	0	0	0	0	
13th, 4 p. m....	1	6	0	0	0	0	1	6	
14th, 2 p. m....	0	8	0	0	0	0	1	14	
16th, noon.....	0	0	0	0	0	0	1	8	
18th, 3 p. m....	0	0	0	0	0	0	0	0	
29th, 2 p. m....	1	9	0	0	—	—	1	9	
30th, noon.....	0	0	0	0	0	0	1	9	

Professor Hinrichs, of the Iowa Weather Service, states that at Iowa City "large sun-spots were seen on the 3rd, 15th and 23rd."

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Brig. Gen. (Bvt. Assgd.) Chief Signal Officer, U. S. A.